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SOURCE

1. In the year 1949 in the Soviet Union a big campaign was launched to standarize all internal combustion marine engines, both primary and auxiliary. This work was considered very important because there are more than 180 different types of internal combustion engines in use in ships. A standardization of these engines would facilitate manufacture and supply of spare parts.

2. At the present time internal combustion engines bear the following standard "GOST 4393-48". Basically the engines are categorized as follows: Method by which the working cycle is fulfilled - four stroke (Ch) or two stroke (D); method of action - single or dual (DD); method of filling the working cylinder with fresh fuel, with or without supercharging (N); construction, cross-headed (K) or piston engine with vertical or horizontal cylinders, with opposing stroke pistons or normal position pistons, reverse or equipped with reverse coupling (S); and finally numbers are used to show the number of cylinders, their diameter in centimeters and their piston stroke in centimeters.

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(A) Two Stroke Internal Combustion Engines

(1) 8D-20/30
A two stroke, 8-cylinder engine, simple action with cylinder diameter of 200mm and piston stroke 300mm. Effective power 200 hp, 430 rpm.

(2) 6DR-24/38
Two stroke, 6-cylinder, simple action, cylinder diameter 240mm, piston stroke 380 mm, effective power 360 hp, 420 rpm.

(3) 8DR-30/40
Two stroke, 8-cylinder, simple action, cylinder diameter 300mm, piston stroke 400mm, effective power 400 hp, 300 rpm.

(4) 8D-16.5/18
Two stroke, 8-cylinder, simple action, cylinder diameter 165mm, piston stroke 180mm, effective power 530 hp, 1270 rpm.

(5) 6DR-30/50
Two stroke, 6-cylinder, simple action, cylinder diameter 300mm piston stroke 500mm, effective power 600 hp, 300 rpm.

(6) 6DR - 21.6/25.4
Two stroke, 6-cylinder, simple action, cylinder diameter 216mm, piston stroke 254mm, effective power 600 hp, 800 rpm.

(7) 8D - 25.6/34.3
Eight-cylinder, simple action, cylinder diameter 256 mm piston stroke 343 mm, effective power 900 hp, 500 rpm.

(8) 8D - 10.5/16
Eight-cylinder, simple action, cylinder diameter 105 mm, piston stroke 160 mm, effective power 1200 hp, 2800 rpm.

(9) 8DR - 43/61
Eight-cylinder, simple action, cylinder diameter 430 mm, piston stroke 610 mm, effective power 2000 hp, 250 rpm.

(10) 6DK - 60/104
Six-cylinder, cross-headed, cylinder diameter 600 mm, piston stroke 1040 mm, effective power 2100 hp, 135 rpm.

(11) 4DK - 58/115
Four-cylinder, cross-headed, cylinder diameter 580 mm, piston stroke 1150 mm, effective power 3300 hp, 100 rpm.

(12) 6D - 52/60
Six-cylinder, cylinder diameter 520 mm, piston stroke 600 mm, effective power 3600 hp, 420 rpm.

(13) 8DKR - 72/125
Eight-cylinder, cross-headed, cylinder diameter 720 mm, piston stroke 1250 mm, 5500 hp, 125 rpm.

(14) 10DKR - 68/120
Ten-cylinder, cross-headed, cylinder diameter 680 mm, piston stroke 1200 mm, 7350 hp, 120 rpm.

(15) 10DD - 60/90
Ten-cylinder, dual action, cylinder diameter 600 mm, piston stroke 900 mm, 10720 hp, 214 rpm.

(16) 6DPP - 10.5/2x16
Six-cylinder, horizontally mounted, with opposing piston strokes, cylinder diameter 105 mm, piston stroke 160 mm, 950 hp, 2500 rpm.

(17) 8DPP - 20.6/2x25.4
Eight-cylinder, horizontally mounted, opposing piston strokes, cylinder diameter 206 mm, piston stroke 254 mm, 1400 hp, 720 rpm.

(18) 8DNG - 18/2x25
Eight-cylinder with supercharger, horizontally mounted, opposing cylinder stroke, cylinder diameter 180 mm, general piston stroke 2x250 mm, 2500 hp, 1000 rpm.

(19) 6DNG - 32/2x40
Six-cylinder with supercharger, horizontally mounted, opposing cylinder stroke, cylinder diameter 320 mm, general piston stroke 2x400 mm, 4000 hp, 440 rpm.

(B) Four stroke internal combustion engines.

(1) 6Ch - 16.5/21
Six-cylinder, cylinder diameter 165 mm, piston stroke 210 mm, 200 hp, 1300 rpm.

(2) 6Ch-27/35
Six-cylinder, cylinder diameter 270 mm, piston stroke 350 mm, 240 hp, 325 rpm.

(3) 4Ch-42.5/60
Four-cylinder, cylinder diameter 425 mm, piston stroke 600 mm, 360 hp, 190 rpm.

(4) 4Ch-46/63
Four-cylinder, cylinder diameter 460 mm, piston stroke 630 mm, 520 hp, 215 rpm.

(5) 6ChN-45/42
Six-cylinder with supercharger, cylinder diameter 450 mm, piston stroke 420 mm, 600 hp, 450 rpm.

(6) 6Ch-30/45
Six-cylinder, cylinder diameter 300 mm, piston stroke 450 mm, 200 hp, 300 rpm.

(7) 6ChN-18/25
Six-cylinder with supercharger, cylinder diameter 180 mm, piston stroke 250, 700 hp, 1600 rpm.

(8) 8Ch-30/38
Eight-cylinder, cylinder diameter 300 mm, piston stroke 380 mm, 800 hp, 600 rpm.

(9) 6ChN-30/38
Six-cylinder with supercharger, cylinder diameter 300 mm, 950 hp, 600 rpm, piston stroke 380 mm.

(10) 6Ch-40/46
Six-cylinder, cylinder diameter 400 mm, piston stroke 460 mm, 1200 hp, 470 rpm.

(11) 6ChN-35/43
Six-cylinder with supercharger, cylinder diameter 350, piston stroke 430 mm, 1400 hp, 600 rpm.

(12) 6Ch-58/84
Six-cylinder, cylinder diameter 580 mm, piston stroke 840 mm, 1575 hp, 190 rpm.

(13) 6ChN-40/46
Six-cylinder with supercharger, cylinder diameter 400 mm, piston stroke 460 mm, 2000 hp, 520 rpm.

(14) 6ChN-31.7/33
Six-cylinder with supercharger, cylinder diameter 317 mm, piston stroke 330 mm, 1000 hp, 740 rpm.

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4. [redacted] supplementary data on several engines:

(A) Two-stroke engines

(1) 8D-16.5/18

Power	Ne = 530 hp.
Revolutions	n - 1270 rpm
Degree of compression	E - 14.2
Average indicator pressure	Pi 8.22kg/cm^2
Average effective pressure	Pe 6.23 kg/cm
Effective fuel consumption	Qe 209 grms/ per hour

(2) 6 DR - 30/50

Power	Ne - 600 hp.
Revolutions	n - 300 rpm.
Degree of compression	E - 13
Average effective pressure	Pe - 4.5 kg/cm^2
Effective fuel consumption	Ge - 175 grms/ per hour

(3) 8 DR - 43/61

Power	Ne - 2,000 hp.
Revolutions	n - 250 rpm.
Degree of compression	E - 13.5
Average effective pressure	Pe - 5.1 kg/cm^2
Effective fuel consumption	Ge - 170 grms/ per hour

(4) 8 DPP - 20.6/2x25.4

Power	Ne - 1400 hp.
Revolutions	n - 720 rpm.
Degree of compression	E - 14
Average effective pressure	Pe - 6.6 kg/cm^2
Effective fuel consumption	Ge - 180 grm/ per hour

(5) 6DPP - 10.5/2x16

Power	Ne - 950 hp.
Revolutions	n - 2,500 rpm.
Degree of compression	E - 14
Average effective pressure	Pe - 7.2 kg/cm^2
Effective fuel consumption	Ge - 175 grm/ per hour

(6) 6DNG - 32/2x40

Power	Ne - 4,000 hp.
Revolutions	n - 440 rpm.
Degree of compression	E - 12.5
Average effective pressure	Re - 10.6 kg/cm^2
Super-charged air pressure	Pk - 2.0 kg/cm^2
Effective fuel consumption	Ge - 173 grms/ per hour

(7) 8DNG - 18/2x25

Power	Ne - 2500 hp.
Revolutions	n - 1,000 rpm.
Degree of compression	E - 13
Average effective pressure	Pe - 12.3 kg/cm^2
Super-charged air pressure	Pk - 2.5 kg/cm^2

(8) 8DKR - 72/125

Power	Ne - 5500 hp.
Revolutions	n - 125 rpm.
Average indicator pressure	Pi - 5.7 kg/cm^2
Average effective pressure	Pe - 4.9 kg/cm^2
Degree of compression	E - 13
Effective fuel consumption	Ge - 152 grms/ per hour

(B) Four-stroke engines

(1) 8Ch - 30/38

Power	Ne - 800 hp.
Revolutions	n - 600 rpm.
Degree of compression	E - 13.5
Average indicator pressure	7.7 kg/cm^2
Average effective pressure	5.6 kg/cm^2
Effective fuel consumption	190 grms/ per hour

(2) 6ChN - 30/38

Power	950 hp.
Revolutions	600 rpm.
Average effective pressure	7.6 kg/cm^2
Degree of compression	12.5
Effective fuel consumption	169 grms/ per hour

(3) 4Ch - 42.5/60

Power	360 hp.
Revolutions	190 rpm.
Degree of compression	13.5
Average effective pressure	5.0 kg/cm^2
Average indicator pressure	6.0 kg/cm^2

(4) 4Ch - 46/63

Power	520 hp.
Revolutions	215 rpm.
Degree of compression	13.5
Average indicator pressure	5.2 kg/cm^2
Average effective pressure	6.25 kg/cm^2

5. The minimum degree of compression (E) is determined by accounting for the temperature at the end of the compression (Pc) which is necessary for igniting the fuel. In ship engines the minimum temperature at the end of compression should be more or at least equal to 760 - 800 degrees in absolute units.

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6. The degree of compression for internal combustion ship engines is determined within the following bounds:

(A) For low-speed engines E - 13-14

(B) For medium fast engines E - 14-15

(C) For fast engines E - 14-18

(D) For super-charged engines E - 12-13

7. Pressure at the end of compression for ship engines is as follows:

(A) For low-speed engines Kc-30 - 35 kg/cm^2

(B) For high-speed engines Pc-35 - 45 kg/cm^2

8. Pressure at the end of compression in super-charged engines is as follows:

(A) For medium high-speed Pc-40 - 50 kg/cm^2

(B) For high-speed Pc-50 - 60 kg/cm^2

9. Low-speed ship engines in the USSR are those engines with an average speed of piston stroke (Cm) from four to six meters a second and with a number of crank shaft revolutions (n) of less than 500 per minute.

10. Medium high-speed engines are those having an average piston stroke speed of six to nine meters a second and crank shaft revolutions of from 500 to 1,000 per minute. High-speed engines are those having an average piston stroke speed of from nine to twelve meters per second and crank shaft revolutions of more than 1,000 per minute.

11. Such a break-down of ship engines is used as one criterion for the selection of fuel types and for all kinds of accounting purposes.

12. Correspondingly "GOST - 4393-48" ship engines are divided into two groups as far as speed is concerned:

(A) Low speed with average speed of piston stroke less than 6.5 meters per second;

(B) High speed with average piston stroke speed of more than or equal to 6.5 meters per second.

This is one of the so-called classification signs used on internal combustion marine engines. 50X1